WHAT IS CLAIMED IS:

1. A inter-symbol-interference (ISI) coder comprising:

a mapper operational to map at least one input symbol sequence into a set of multiple sequences of extended symbols; and

a linear ISI filter operational to generate coded output symbols in response to the set of multiple sequences of extended symbols.

2. The ISI coder according to claim 1, wherein the linear ISI filter is selected from the group consisting of an finite impulse response (FIR) filter, and an infinite impulse response (IIR) filter.

3. The ISI coder according to claim 1, wherein the linear ISI filter is configured such that its convolution with a channel impulse response yields a desired ISI generating pattern.

4. The ISI coder according to claim 1, wherein the mapper is further operational to select the extended symbols from the same grid associated with the input symbols to yield a same minimum distance.

5. The ISI coder according to claim 1, wherein the mapper has a transform that is invertible such that no two input sequences are mapped into the same sequence of extended symbols.

6. The ISI coder according to claim 1, wherein the mapper comprises a sequence selection algorithm that operates to select the best sequence from the set of multiple sequences of extended symbols.

7. A method of channel coding, the method comprising the steps of:

providing a non-linear precoder; and

inserting deliberate inter-symbol-interference (ISI) into an input signal via the non-linear precoder such that input data is mapped into a lattice having a better distance spectrum than an uncoded QAM signal while retaining a substantially unchanged power level from the uncoded QAM signal.

8. The method according to claim 7, wherein the non-linear precoder comprises

a mapper operational to map at least one input symbol sequence into a set of multiple sequences of extended symbols; and

a linear ISI filter operational to generate coded output symbols in response to the set of multiple sequences of extended symbols.

9. The method according to claim 7, wherein the step of inserting deliberate ISI into an input signal comprises the steps of:

mapping at least one input symbol sequence into a set of multiple sequences of extended symbols; and

convolving a linear filter with an associated channel impulse response to yield a desired ISI generating pattern.

10. The method according to claim 9, wherein the step of mapping at least one input symbol sequence into a set of multiple sequences of extended symbols comprises selecting the best sequence from the set of multiple sequences of extended symbols.